

WHAT IS CLAIMED IS:

1. An optical luminescent display device, comprising:
 - a luminescent material;
 - a first energy source which generates a first radiant energy for continuously illuminating said luminescent material; and
 - a second energy source which generates a second radiant energy for selectively illuminating said luminescent material to thereby control emission of visible light.
2. The optical luminescent display device of claim 1, wherein said first radiant energy is at a higher level than said second radiant energy.
3. The optical luminescent display device of claim 1, said first energy source is a high-power UV light source, and said second energy source is a low-power IR light source.
4. The optical luminescent display device of claim 3, wherein said luminescent material is a storage phosphor which is charged by said UV light source, and which emits said visible light when illuminated by said IR light source.

5. The optical luminescent display device of claim 1, further comprising a screen coated with a grid of dots, each of said dots constituted by said luminescent material.

6. The optical luminescent display device of claim 1, wherein said first energy source keeps said luminescent material charged.

7. The optical luminescent display device of claim 1, further comprising means for selectively delivering said second radiant energy to said luminescent material to thereby selectively illuminate said luminescent material by said second radiant energy.

8. The optical luminescent display device of claim 5, further comprising a mirror configured such that said second radiating energy illuminates each of said dots sequentially and periodically.

9. The optical luminescent display device of claim 8, wherein said mirror is configured such that said second radiating energy illuminates said dots in a zig-zag pattern.

10. The optical luminescent display device of claim 5, wherein said second energy source comprises a plurality of said sources of said second radiant energy arranged along one of a vertical and an horizontal axis of said grid, and

said optical luminescent display device further comprises a mirror arranged such that said second radiant energy radiating from said plurality of sources periodically swipes across said grid along another of said vertical and said horizontal axis.

11. The optical luminescent display device of claim 5, further comprising an LCD projection system disposed such that said second radiant energy selectively illuminates said dots.

12. An optical luminescent display device containing luminescent material, said luminescent material converting UV light incident thereon to visible light and ceasing to convert said UV light incident thereon to said visible light when IR light is incident thereon.

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13. The optical luminescent display device of claim 12, wherein said luminescent material is a phosphor.

14. The optical luminescent display device of claim 13, wherein said phosphor is ZnS:Sm.

15. An optical luminescent display device, comprising:
a luminescent material;
a first energy source which generates a first radiant energy for illuminating said luminescent material; and
a second energy source which generates a second radiant energy for illuminating said luminescent material to thereby control emission of visible light,
wherein said luminescent material converts said first radiant energy to visible light and ceases to emit said visible light when illuminated by said second radiant energy.

16. The optical luminescent display device of claim 15, wherein said luminescent material will not convert said first radiant energy to visible light if illuminated by said second radiant energy.

17. The optical luminescent display device of claim 16, wherein said first radiant energy is UV light and said second radiant energy is IR light.

18. The optical luminescent display device of claim 15, further comprising a first and a second side-emitting optical fibers disposed not parallel with respect to each other, said first and second side-emitting optical fibers receiving said second radiant energy and selectively delivering said second radiant energy to said luminescent material,

wherein said luminescent material emits visible light only if said first and second fibers do not deliver said second radiant energy to said luminescent material.

19. The optical luminescent display device of claim 18, further comprising a plurality of said first and second side-emitting optical fibers forming a two-dimensional grid disposed substantially parallel to a plain containing said luminescent material.

20. The optical luminescent display device of claim 15, further comprising at least one side-emitting fiber which receives said first and second radiant energy and selectively delivers said first and second energy to said luminescent material.

21. The optical luminescent display device of claim 19, wherein said first side-emitting fiber is disposed on one side of said plain and said second side-emitting fiber is disposed on another side of said plain.

22. An optical luminescent display device, comprising:

- a luminescent material;
- a first energy source which generates a first radiant energy for continuously illuminating said luminescent material;
- a second energy source which generates a second radiant energy for selectively illuminating said luminescent material to thereby control emission of visible light;
- a plurality of pixels containing said luminescent material; and
- a substrate shaped to evenly distribute said first radiant energy to said plurality of pixels.

23. The optical luminescent display device of claim 22, further comprising a first plurality and a second plurality of side-emitting optical fibers disposed substantially parallel to said substrate, said first side-emitting optical fibers disposed not parallel to said second side-emitting optical fibers, said first and second side-emitting optical fibers receiving said second radiant energy and selectively delivering said second radiant energy to said pixels.

24. The optical luminescent display device of claim 23, wherein said second energy source comprises a plurality of individual sources of said second radiant energy, each of said individual sources delivering said second radiant energy to each of said first and second side-emitting optical fibers.

25. The optical luminescent display device of claim 24, wherein said individual sources are IR laser diodes.

26. The optical luminescent display device of claim 24, further comprising a control logic which coordinates said individual sources to thereby control said emission of visible light.

27. The optical luminescent display device of claim 15 further comprising side emitting optical fibers adapted for supplying at least one of said first and second radiant energies to said luminescent material.

28. The optical luminescent display device of claim 15 further comprising:

an optical fiber; and
a notch formed in said optical fiber adapted to direct at least one of said first and second radiant energies toward said luminescent material.

29. An optical luminescent display device of claim 28, further comprising a reflective coating mounted on said optical fiber transversally opposite from said notch.

30. An optical luminescent display device of claim 28, further comprising:

a second optical fiber; and

a second notch formed in said second optical fiber adapted to direct at least one of another of said first and second radiant energies toward said luminescent material.

31. The optical luminescent display device of claim 30, wherein said optical fiber and said second optical fiber are formed of plastic.

32. The optical luminescent display device of claim 30, wherein said optical fiber and said second optical fiber are formed of glass.

33. The optical luminescent display device of claim 30, wherein said notch and said second notch are filled.

34. The optical luminescent display device of claim 30, wherein said luminescent material is a phosphor.

35. The optical luminescent display device of claim 30, wherein said first radiant energy is UV light, and said second radiant energy is IR light.

36. The optical luminescent display device of claim 30, further comprising a mirror coating formed in said second notch.

37. The optical luminescent display device of claim 28, wherein said luminescent material is a phosphor consisting essentially of ZnS:Sm.

38. The optical luminescent display device of claim 1 further comprising:
an optical fiber; and
means for deviating a path of radiation travelling within said optical fiber away from the axis of said optical fiber toward said luminescent material.

39. A method for causing a luminescent material to emit visible light, comprising:
supplying a first radiant energy to said luminescent material for charging said luminescent material;
supplying a second radiant energy to said luminescent material such that said luminescent material emits visible light only when said second radiant energy is incident on said material.

40. The method for causing a luminescent material to emit visible light of claim 39 wherein said first radiant energy is supplied by a constant source of said first radiant energy, and said second radiant energy is supplied periodically to thereby control emission of said visible light.

41. The method for causing a luminescent material to emit visible light of claim 39 wherein at least one of said first radiant energy and said second radiant energy is supplied by a side-emitting optical fiber.

42. A method for causing a luminescent material not to emit visible light, comprising:

supplying a first radiant energy to said luminescent material, said luminescent material being adapted to converts said first radian energy into said visible light; and

supplying a second radiant energy to said luminescent material, such that said luminescent material does not emit said visible light when said second radiant energy is incident on said material.

43. The method for causing a luminescent material not to emit visible light of claim 42 wherein at least one of said first radiant energy and said second radiant energy is supplied by a side-emitting optical fiber.

44. The method for causing a luminescent material to emit visible light of claim 39, wherein said first radiant energy is UV light, and said second radiant energy is IR light.

45. The method for causing a luminescent material not to emit visible light of claim 42, wherein said first radiant energy is UV light, and said second radiant energy is IR light.

46. The method for causing a luminescent material not to emit visible light of claim 42, wherein said luminescent material is a phosphor consisting essentially of ZnS:Sm.